PROVISIONAL REVIEW OF THE GENUS *POLYACANTHONOTUS* (PISCES, NOTACANTHIDAE) WITH DESCRIPTION OF A NEW ATLANTIC SPECIES, *POLYACANTHONOTUS MERRETTI*

by

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RÉSUMÉ. – Les auteurs ont étudié un grand nombre de spécimens du genre *Polyacanthonotus*. Cette étude a permis une révision préliminaire du genre. Parmi les spécimens étudiés, une espèce nouvelle, *Polyacanthonotus merretti* est décrite. Cette nouvelle espèce bathyale a été capturée sur deux rives de l'Atlantique Nord (au Sud de 40°N) entre 594 et 2000 mètres de profondeur. Le nom *P. africanus* est un synonyme plus récent de *P. challengeri*, une espèce abyssale (entre 1302 et 3753 mètres) répandue dans tous les océans (surtout à des latitudes plus hautes que 30° N ou S). L'unité taxinomique de *P. rissoanus* reste en suspens. Une clé préliminaire est donnée pour les espèces du genre.

SUMMARY. – A large number of specimens of the genus *Polyacanthonotus* has been studied, enabling a provisional review of the genus. From Atlantic specimens studied, a new species, *Polyacanthonotus merretti*, is described. This new bathyal species has been captured on both sides of the North Atlantic (below 40° N) between 594-2000 m. The name *P. africanus* is a junior synonym of *P. challengeri*, a circumglobal (mostly above 30° N or S) abyssal species (1302-3753 m). The taxonomic integrity of *P. rissoanus* remains in question. A provisional key to species of the genus is presented.

Key-words: Notacanthidae, *Polyacanthonotus merretti*, new species, Teleostean, *Polyacanthonotus challengeri*, *Polyacanthonotus rissoanus*, abyssal zone, bathyal zone, AN, North Atlantic.

INTRODUCTION

The notacanthid genus *Polyacanthonotus* was most recently revised by McDowell (1973). Three species were then recognized: two Atlantic species, *P. rissoanus* (Filippi and Vérany, 1859) and *P. africanus* (Gilchrist and von Bonde, 1924), and the

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Pacific species *P. challengeri* (Vaillant, 1888). At the time of his revision MacDowell had only limited material available for study, and the status of apparent geographic populations remained uncertain. Subsequently, considerable new material has become available from diverse regions enabling a reconsideration of the status of species of *Polyacanthonotus*.

The present study of new and previously available material demonstrates that *P. africanus (sensu stricto)* is a junior synonym of *P. challengeri*. McDowell (1973) correctly anticipated the possibility of such a synonymy. As understood from the present study *P. challengeri* is a large circumglobal, abyssal species, primarily inhabiting cool latitudes (higher than 30° N or S). A small previously undescribed counterpart of *P. challengeri* inhabits generally warmer latitudes (below 40° N) at bathyal depths in the North Atlantic. The new amphi-Atlantic species, *Polyacanthonotus merretti* is described in the present study. Aspects of its life history will be summarized in a subsequent manuscript (Crabtree, Sulak and Musick, in press). Although McDowell (1973) erroneously treated specimens of the new species as conspecific with *P. africanus* (= *P. challengeri*), his morphological contrast of « open Atlantic » (= *P. challengeri)* versus « Gulf of Mexico and Carribbean » (= *P. merretti*) study material presaged the existence of an undescribed species in the Atlantic.

Study of material attributed to *P. rissoanus* is in progress. Sufficient Mediterranean material has not yet been assembled to compare with material from various regions of the open Atlantic. However, there is evidence of both morphological and ecological differentiation between the Mediterranean and Atlantic populations attributed to *P. rissoanus.* In conjunction with such evidence, the example of the *P. challengeri - P. merretti* species-pair (as discussed below) leads us to hypothesize the existence of a parallel species pair within « *P. rissoanus* ». The name *P. rissoanus* is provisionally retained, but regional differences are summarized in the key to species presented.

METHODS

The conventions established by Hubbs and Lagler (1958) were applied for counts and measurements with these exceptions or additions : pectoral ray counts included fulcral spines, if present; internarial distance was defined as the greatest span between the anterior and posterior nostrils or nares (tip to tip); morphometric data were expressed as percent of gnathoproctal length, head length, or horizontal eye (transparent spectacle) diameter. Dial calipers were used for small scale measurements (values to the nearest 0.1 mm).

Abbreviations used in the text and Table I are as follow.

Institutions : AMNH - American Museum of Natural History, New York; BMNH - British Museum (Natural History), London; FMNH - Field Museum of Natural History Chicago; IOS - Institute of Oceanographic Sciences, Godalming, England; ISH - Institute für Seefischerei, Hamburg; LACM - Los Angeles County Museum; MCZ - Museum of Comparative Zoology, Harvard University; MNHN - Muséum National d'Histoire Naturelle, Paris; MSNG - Museo di Storia Naturale, Genova; OSUO - Oregon State University School of Oceanography, Corvallis; SAM - South African Museum, Cape Town; UMML - University of Miami, Miami, Florida;

USNM - U.S. National Museum of Natural History, Washington, D.C.; VIMS - Virginia Institute of Marine Science, Gloucester Point, Virgina; ZMB - Zoological Museum, Bergen, Norway. *Geographic regions* : BB - Bahama Basins; BS - Bering Sea; CB - Cape Basin; CCB - Canary, Cape Verde Basin; CS - Caribbean Sea; GB - Guiana Basin; GEB - Guinea Basin; GM - Gulf of Mexico; NB - North American Basin; NEP - northeastern Pacific; NWP - Northwest Pacific Basin; SIO - Southern Indian Ocean; SWP - Southwest Pacific Basin; WEB - West European Basin. *Length measurements* : TL = total length, GPL = gnathoproctal length, HL = head length, ED = horizontal eye (transport spectacle) diameter.

PROVISIONAL KEY TO SPECIES
OF THE GENUS *POLYACANTHONOTUS*

1a. Posterior border of mouth extending to or beyond anterior edge of eye; 21 or fewer gill rakers on anterior arch . . . . 2.

1b. Posterior border of mouth falling well short of anterior edge of eye; 22 or more gill rakers on anterior arch (*P. rissoanus* Mediterranean and Atlantic, 540-2875 m) . . . . 3.

2a. Anterior and posterior nostrils closely set, greatest span across them 33-62 percent of horizontal eye diameter; adults large, typically 350-550 mm TL; total vertebral count 254 of greater . . . . *P. challengeri*, circumglobal, largely bipolar, 1302-3753 m.

2b. Anterior and posterior nostrils set far apart, greatest span across them 67-103 percent of horizontal eye diameter; adults small, typically less than 300 mm TL; total vertebral count 245 or fewer . . . . . . *P. merretti* n. sp., amphi-Atlantic, 594-2000 m.

(3a)(1) Palatine with 17-24 teeth, dentary with 20-25 teeth, on each side; pectoral insertion nearer tip of snout than anus; outermost pelvic ray flexible; adults large, typically exceeding 350 mm TL . . . . . Atlantic *P. rissoanus* (in 3.6-11.0°C bottom waters).

(3b)(1) Palatine with 29-30 teeth, dentary with 30-31 teeth, on each side; pectoral insertion nearer anus than tip of snout; outermost pelvic element spine-like; adults small, maximum known TL is 230 mm (sexually mature female) . . . . Mediterranean *P. rissoanus* (in 13.0-14.5°C bottom waters).

Polyacanthonotus merretti n. sp.

(Figs. 1, 2; Table I)

Material examined (54 specimens)

Holotype : USNM 261461, collection data presented in Table I.

Paratypes : 23 specimens, collection data presented in Table I.

Additional study material : 20 specimens, 202-316 mm TL (number of specimens and geographical region abbreviation given in parentheses for each collection) -

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(1) Morphological details differentiating *P. rissoanus* population taken from McDowell (1973).

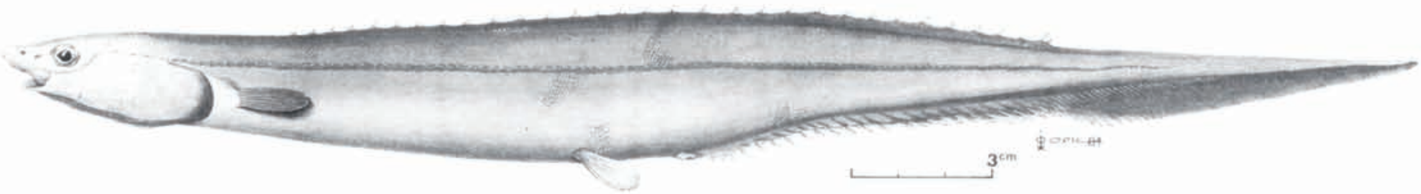

Fig. 1. – *Polyacanthonotus merretti* n. sp. : lateral view of the holotype, USNM 261461.

MCZ 60916 (1, GM); UMML 23228 (1,CS), 24646 (1, GB), 28509 (1, CS), 34303 (1, BB), 34304 (2, BB), 34306 (1, BB), 34307 (3, BB); USNM 204216 (1, GM); VIMS 03102 (1, NB), 04082 (1, NB), 05811 (6, BB).

TABLE I. – Collection data on type material of *Polyacanthonotus merretti* sp. nov.

Museum[a]	Catalog No.	No. Spec.	Sex	TL (mm)	GPL (mm)	Vessel	Cruise No.	Sta. No.	Date	Lat. (N)	Long. (W)	Depth (m)	Temp. (°C)
HOLOTYPE:													
USNM	261461	1	F	275	109	Iselin	7305	57	27 II 73	24°05′	77°23′	1404	4.2
PARATYPES:													
AMNH	55498	1	F	282	112	Iselin	7601	30	24 I 76	36 57	74 29	1568	3.9
BM(NH)	1983.9.14.1	1	F	245	96	Discovery	—	9017	18 VIII 76	29 07	12 41	1368	—
FMNH	94950	1	F	316	123	Gilliss	7404	71	17 XI 74	36 38	74 28	1701	3.8
ISH	10/84	1	F	198	81	Gilliss	7404	106	24 XI 74	37 06	74 24	1407	3.9
LACM	43615-1	1	F	295	118	Gilliss	7508	93	19 IX 75	36 37	74 25	1803	3.6
MCZ	51631	1	M	166	67	Oregon	—	2577	30 VII 59	27 48	88 45	1783	—
MNHN	1984-433	1	F	270	109	Iselin	7305	57	27 II 73	24 05	77 23	1404	4.2
UMML	31539	4	F	253-257	105-106	Iselin	7305	53	26 II 73	23 48	77 03	1325	4.3
UMML	34302	2	M/F	223/257	94/101	Iselin	7402	154	5 II 74	23 32	76 46	1311	4.3
UMML	34308	4	F	233-279	91-111	Iselin	7603	435	9 III 76	23 50	77 16	1380	4.2
USNM	204217	1	F	230	92	Oregon	—	3663	28 VII 62	28 56	88 08	1532	5.0
VIMS	03103	4	F	277-293	105-120	Iselin	7310	95	15 VI 73	37 02	74 22	1591	3.8
VIMS	06988	1	F	295	116	Iselin	8007	C063	21 IX 80	29 06	77 08	1093	5.7

[a] Institutional abbreviations listed in text.

Description of the holotype (with ranges of values for all study material in parentheses).

Meristic data : Dorsal spines 31 (28-36); pelvic spines and rays (left/right I+8/I+8 (I-II+6-8); pectoral rays (L/R) 9/10 (8-12); gill rakers, anterior arch (L) 4+10 (4-5+8-14); lateral line scales (pores) to level of vent 52 (48-56); total vertebrae 237 (224-245); vertebrae to dorsal origin 16 (11-16); vertebrae underlying dorsal base 87 (82-91); vertebrae to anal origin 57 (49-57); vertebrae between pectoral insertion and dorsal origin 6 (1-7).

Morphometeric data : GPL = 40 (37-43) % TL; HL = 39 (31-41) % GPL; snout length = 29 (28-37) % HL; ED = 13 (12-18) % HL; predorsal distance = 47 (42-51)% GPL; preanal distance = 113 (104-113)% GPL; internarial distance = 77 (67-103)% ED).

Color : fresh specimens light bluish-grey to brown; edge of gill cover black; inside of mouth and gill cover black; head appearing bluish ventrally and ventro-laterally due to black pigmentation of buccal cavity internally.

Cephalic lateral system : the distribution of head pores is displayed in Fig. 2. The numbering system used is that of Trotti (1940); terminology of canals follows McDowell (1973).

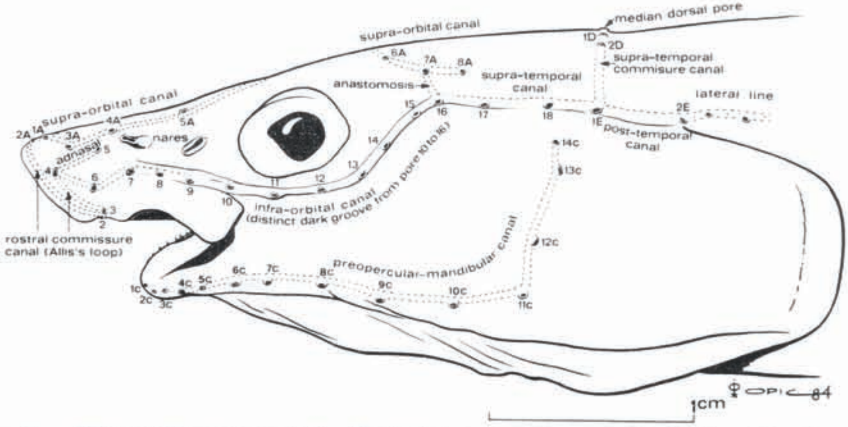

Fig. 2. – *Polyacanthonotus merretti* : Cephalic lateral system and distribution of head pores.

Sexual dimorphism, while females and immature males of *P. merretti* have colorless and relatively inconspicuous nostrils, males with maturing gonads have darkened, enlarged nostrils. Developing males also display somewhat enlarged eyes, a feature displayed in the maturing males of other elopomorph fishes. Four developing males had significantly larger ($p < 0.05$, Mann-Whitney «U» test) eyes (range in ED 15.4-17.7 % HL, mean 16.7 ± 1.6 C.I.) than 32 females (range in ED 12.2-16.7% HL, mean 13.8 ± 1.0 C.I.). In addition to these differences in external morphology, sex ratios in *P. merretti* are higly skewed in favor of females (Crabtree, Sulak and Musick, in press).

Diagnosis

A *Polyacanthonotus* with the posterior border of the mouth extending to or beyond the anterior edge of the eye; widely spaced nares, internarial distance 67-103 % ED; 13-19 gill rakers on the anterior arch; 10-13 pores along the suborbital to postorbital arc of the infra-orbital canal (e.g., pores 4 through 16 in Fig. 2); 224-245 total vertebrae; 82-91 vertebrae underlying the dorsal fin base; 28-36 dorsal fin spines; dorsal fin inserted just opposite or behind pectoral insertion (never in advance), separated from pectoral insertion by one to seven vertebrae; body length rarely exceeding 300 mm TL; 8-12 pectoral fin rays (including fulcral spines).

Relationships

Polyacanthonotus merretti appears very closely related to its larger congener *P. challengeri*. In contrast to *P. rissoanus*, both have a relatively large mouth posteriorly to the level of the eye. Both also agree closely in many details of external morphology. Thus McDowell (1973) included specimens of the new species within his study material of «*P. africanus*» (= *P. challengeri*).

However, *P. merretti* and *P. challengeri* can be unequivocally distinguished by relative internarial distance and total vertebral count. Moreover differences in a number of other characters also tend to distinguish the two species. Finally, a great size disparity exists between adults of the respective species.

Externally, the most trenchent morphological detail distinguishing the two species is degree of separation of the anterior and posterior nostrils. In *P. challengeri*, regardless of size of individual, the nostrils are very closely set, lying immediately adjacent to one another. In *P. merretti* the nostrils are widely separated. Expressed as a function of ED, internarial distance in *P. merretti* ranges from 67-103 % ED as compared to 33-62 % in *P. challengeri*. Moreover, it should be noted that the lowest values observed in *P. merretti* came from developing males with enlarged eyes (above). Thus, while the nostrils remain widely separated in such males, internarial span relative to increased eye diameter is effectively reduced. This is not an important qualification to differentiating the two species, since males are rarely encountered (above).

The two species also tend to differ externally in dorsal spine and pectoral fin ray counts (Table II). Most *P. merretti* have 34 or fewer dorsal spines, and 11 or fewer pectoral rays; most *P. challengeri* have 34 or more dorsal spines and 11 or more pectoral rays. The two species tend to differ as well in number of pores along the sub-orbital to post-orbital arc of the infra-orbital cephalic lateral canal. Along this portion of the infra-orbital canal (anterior-most pore on the side of the snout to the pore at the supra-orbital - infra-orbital anastomosis) *P. merretti* typically has 11 or 12 pores (Fig. 2, pores 4 through 16), while *P. challengeri* typically has 13 or 14 (range in *P. merretti* 10-13; in *P. challengeri* 12-15). Position of the first dorsal fin spine is a variable character in both species. However, while the first spine in *P. challengeri* is often inserted well in advance of the pectoral fin insertion, this is never the case in *P. merretti*.

Internally, *P. merretti* and *P. challengeri* can be distinguished unequivocally on the basis of total vertebral count (Table II). While the related halosaurs often display damage to and regeneration of their long, delicate tails (Sulak, 1977), this is much less commonly the case with notacanths. Thus, total vertebral counts can usually be reliably obtained in *Polyacanthonotus*. Vertebral number is high in both species, but appears stable within each species across the size range examined. In *P. merretti* the highest vertebral count observed was 245, while the lowest count observed in *P. challengeri* was 254. Also tending to distinguish the two species are counts of vertebrae underlying the dorsal fin, counts of vertebrae to the level of the fin (Table II), and placement of the dorsal fin relative to the pectoral fin in relation to the vertebral column. In *P. challengeri* the dorsal insertion varies from three vertebrae in advance of to four vertebrae behind the pectoral insertion. In *P. merretti* dorsal insertion varies from one to seven vertebrae behind the pectoral insertion.

As appears to be typical of many other species of deep-sea bottom fishes, most individuals of *P. merretti* and *P. challengeri* thus far obtained have been adults. Furthermore, due to the great size disparity between adults in the two species, body size alone is often a good indication of specific identity. Adults of *P. merretti* rarely exceed 300 mm TL (one of 54 specimens examined), while most

TABLE II. – Comparative distribution of meristic data for selected characters among species of *Polyacanthonotus* from the present study.

TOTAL VERTEBRAE

COUNT:	220-229	230-239	240-249	250-259	260-269	270-279	280-289	290-299
P. merretti	6	17	6	--	--	--	--	--
P. challengeri	--	--	--	4	9	9	5	--
P. rissoanus	--	--	--	--	--	--	--	2

VERTEBRAE UNDERLYING DORSAL FIN

COUNT:	80-84	85-89	90-94	95-99	100-104	105-109	110-114	115-119
P. merretti	5	28	2	--	--	--	--	--
P. challengeri	--	--	11	10	2	3	--	--
P. rissoanus	--	--	--	--	--	1	--	1

VERTEBRAE TO ANAL FIN ORIGIN

COUNT:	49-50	51-52	53-54	55-56	57-58	59-60	61-62
P. merretti	1	10	19	3	1	--	--
P. challengeri	--	--	2	6	12	4	3
P. rissoanus	--	--	--	1	1	--	--

DORSAL FIN SPINES

COUNT:	28	29-30	31-32	33-34	35-36	37-38	39-40	41	46
P. merretti	3	12	18	11	1	--	--	--	--
P. challengeri[a]	--	--	3	7	8	7	9	4	2
P. challengeri[b]	--	--	2	4	--	1	--	--	--
P. rissoanus	--	2	--	--	--	--	--	--	--

PECTORAL FIN RAYS[c]

COUNT:	8	9	10	11	12	13	14	15
P. merretti	2	22	30	18	3	--	--	--
P. challengeri	--	--	2	5	18	24	25	3

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[a] Material all regions.

[b] North Pacific material only.

[c] Including fulcral spines, if present.

individuals of *P. challengeri* exceed this length (36 of 41 examined). The largest *P. merretti* examined is 316 mm TL; the largest *P. challengeri* is 545 mm TL.

The large bodied *P. challengeri* and its smaller, but morphologically similar counterpart, *P. merretti*, appear to represent a species-pair within *Polyacanthonotus*. Consistent with the concept of a species-pair are the comparative bathymetric and geographic zones occupied by the two species. Despite some minor degree of overlap, these zones tend to be mutually exclusive (Crabtree *et al.*, in press).

Distribution

The new species occurs on both sides of the North Atlantic at bathyal depths (594-2000 m). Most records are from the western Atlantic, where the species ranges from New Jersey to the Guianas (including the Gulf of Mexico, Caribbean, and Bahamas region). In the eastern Atlantic the species is known from four localities off northwestern Africa (N. Merrett, pers. comm.).

Name

The new species is named in honor of Nigel R. Merrett, in recognition of his considerable contributions to the systematics and ecology of deep-sea bottom fishes.

Polyacanthonotus challengeri (Vaillant, 1888)
(Table II)

Synonymy

Notacanthus challengeri Vaillant, 1888
Macdonaldia alta Gill and Townsend, 1897
Macdonaldia longa. Gill and Townsend, 1897
Macdonaldia africana Gilchrist and von Bonde, 1924
Polyacanthonotus vaillanti Fowler, 1934

A more technical list of synonyms and references has been given by McDowell (1973), including his citations to both *P. africanus* and *P. challengeri*. An updated accounting of all known material pertaining to *P. challengeri* will be presented in Crabtree *et al.* (in press).

Material examined

Study material included 41 specimens. Range of TL 135-545 mm. Number of specimens and geographic region given in parentheses for each collection : BMNH 1887.12.7.247 (type of *Notacanthus challengeri* Vaillant, 1888, NWP, 3431 m); IOS « Discovery Collection » 8971 (1, CCB); 8972 (1, CCB), 9640 no 1 (2, WEB), 50712 (2, WEB), 50823 (1, WEB), 50906 (3, WEB), 51201 no 1 (1, WEB), 51412 (1, WEB), 51413 (3, WEB), 51610 no 1 (1, WEB), 51611 no 1 (1, WEB,) 10884 no 1 (1, CCB); ISH 217/75 (1, WEB); MCZ 55226 (1, NB), 58610 (1, NB); MNHN 1887-130 (1, CCB), 1977-207 (1, SIO), 1982-891 (1, CCB), 1982-899 (1, WEB), 1982-900 (1, WEB); OSUO 1891 (1, NEP), 2181 (1, NEP); SAM 21918 (type of *Macdonaldia africana* Gilchrist and von Bonde, 1924, CB, 2232 m), 22896 (1, CB); UMML 20890 (1, GEB); USNM 44248 (type of *Polyacanthonotus vaillanti* Fowler, 1934, NB, 2103 m), 48691 (1, BS), 48774 (type of *Macdonaldia alta* Gill and Townsend, 1897, BS, 2562 m), 48775 (type of *Macdonaldia longa* Gill and Townsend, 1897, BS, 1805 m), 135625 (1, NWP), 263242 (2, SWP); VIMS 05305 (1, NB); ZMB uncat., Michael Sars Expedition station 53 (1, radiograph only, CCB).

Description

Meristic data : Dorsal spines 32-46; pelvic spines and rays I+8-10; pectoral rays 10-15; gill rakers, anterior arch 4-6+8-16 (11-21 total); lateral-line scales (pores) to level to vent 54-61; total vertebrae 254-284; vertebrae to dorsal origin 11-18; vertebrae underlying dorsal base 90-107; vertebrae to anal origin 54-61; dorsal origin 3 vertebrae in advance of to 4 vertebrae behind pectoral insertion.

Morphometeric date : GPL = 34-41 % TL; HL = 29-45 % GPL; snout length = 27-36 % HL; ED = 11-17 % HL; predorsal distance = 27-56 % GPL; preanal distance = 103-114% GPL; internarial distance = 33-62% ED.

The difference in intestinal pigmentation utilized in McDowell's (1973) key to distinguish *P. challengeri* (North Pacific material) from «*P. africanus*» (Atlantic material, including *P. merretti*) is probably an artifact of preservation. Fresh or recently preserved material of both *P. challengeri* and *P. merretti* reveals a brown to black intestine, which fades progressively with time under preservation.

Cephalic lateral system : Essentially as in *P. merretti* (Fig. 2), except that the postorbital portion of the infra-orbital canal usually has one or two more pores than in *P. merretti*. Thus, there are typically 13-14 pores along the sub-orbital to postorbital arc (cf. *P. merretti*, Fig. 2, pores 4-16).

Distribution

As understood from the present study, *P. challengeri* is a circumglobal species. At the time of McDowell's (1973) revision, the species was unrecognized in the Atlantic and unrecorded in the Indian Ocean. Except for two records off northwestern Africa, *P. challengeri* is known only from latitudes higher than 30° N and 30° S. Its distribution is thus predominantly anti-tropical. Most records come from continental rise depths (below 2000 m), with a known bathymetric range of 1302-3753 m. The distribution and life history of *P. challengeri* will be reported on in greater detail by Crabtree *et al.* (in press).

Specimens from the North Pacific appear to differ slightly from Atlantic, South Pacific and Indian Ocean specimens with respect to the dorsal fin. North Pacific specimens display a narrower range in number of dorsal spines (Table II) compared to material from all other regions. Also the first dorsal spine in North Pacific materials tends to be inserted in advance of the pectoral insertion (over vertebra 11-13), while in material from other regions it tends to be inserted just over or behind the pectoral insertion (over vertebra 13-18). Considering the homogeneity apparent among regional specimens in all other characters evaluated, these minor differences characterizing the few North Pacific specimens available for study seem unimportant.

Polyacanthonotus rissoanus
(Filippi and Vérany, 1859)

Material examined

Material for systematic study included two specimens. Range of TL 328-394. SAM 13325 (1, CB); VIMS 04083 (1, NB). In addition a large number of specimens have been examined in conjunction with a companion *Polyacanthonotus* life history study (Crabtree *et al.*, in press).

Discussion

Synopsis of meristic and morphometric characters in *P. rissoanus* awaits examination of additional Atlantic material in conjunction with comparative study of Mediterranean material. Radiography of the two specimens examined reveals an additional point of differentiation (of *P. rissoanus* with respect to *P. challengeri* and *P. merretti*) beyond those documented by McDowell (1973) in his comparison of *P. rissoanus, P. challengeri* and «*P. africanus*» (the latter including both Atlantic *P. challengeri* and *P. merretti*). Total vertebral counts in the two Atlantic *P. rissoanus* examined are 292 and 296, contrasting with counts of 254-284 in *P. challengeri* and 224-245 in *P. merretti.*

The species displays a curious pattern of distribution. If Mediterranean records were excluded *P. rissoanus* would display a classical anti-tropical distribution, with an apparent affinity for cool, high latitudes in both the North and South Atlantic. When Mediterranean records are included, the species displays a zone of disjunction along the slope of the Iberian Basin in the northeastern Atlantic, a relatively well-sampled region. No specimens have been recorded south of ca. 44° N in the northeastern Atlantic until the species appears again in collections from within the Straits of Gilbraltar at ca. 36° N. Moreover, although the depth range reported for Mediterranean captures (500-2830 m) is comparable to that for Atlantic captures (540-2875 m), bottom temperatures at depth are rather different. Atlantic specimens inhabit 3.6-11.0° C bottom waters, while Mediterranean specimens inhabit 13.0-14.5°C waters.

McDowell (1973) noted a substantial size disparity between open Atlantic and Mediterranean specimens of *P. rissoanus*. Atlantic specimens achieve and apparently mature at a larger size. Length data from northwestern Atlantic study material (Crabtree *et al.*, in press; Haedrich, unpubl. data) and from northeastern Atlantic material (Merrett, unpubl. data) support this size difference. Northwestern Atlantic specimens range in length from 296-525 mm TL; mean length in the southern Middle Atlantic Bight is 401 mm TL; females mature at lengths exceeding 353 mm TL. Northeastern Atlantic specimens range between 157-603 mm TL. In contrast the largest known Mediterranean specimen (McDowell, 1973) is a mature female (MSNG 32189) of 230 mm TL.

In addition to the size disparity between specimens from the Atlantic and Mediterranean, a number of apparently minor morphological details distinguish specimens from the respective regions. These details, documented by McDowell (1973), are summarized in the key to species above. McDowell did not consider vertebral counts, which we are now studying. Despite the morphological differences noted, McDowell concluded that only one species was represented among material attributed to *P. rissoanus.*

Given the apparent disjunction between Atlantic and Mediterranean populations of *P. rissoanus*, the difference in bottom water temperature preference or tolerance of the two populations, the great size disparity of specimens from the two populations, and the existing set of morphological features differentially characterizing the two populations, we tentatively hypothesize that these populations represent two distinct species. We are guided as well in erecting this hypothesis by the parallel example of the *P. merretti - P. challengeri* species-pair. As discussed above these two species similarly differ from one another in geographic range and bottom temperature range (Crabtree *et al.*, in press), adult size, and minor details of external morphology. A test of this hypothesis is in progress as part of our continuing study of *P. rissoanus*. It should be noted that *P. rissoanus* was originally described from a Mediterranean specimen, and that the name *P. rostratus* (Collett, 1889) would be available should Atlantic material prove to represent a distinct species.

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